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10/055,811

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Clarbruno Vedruccio

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EXAMINER

SODERQUIST, ARLEN

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|---|--|
| Office Action Summary | Application No. 10/055,811 | Applicant(s) VEDRUCCIO, CLARBRUNO | |
| | Examiner Arlen Soderquist | Art Unit 1797 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,6,8,14,17,18 and 21-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,6,8,14,17,18 and 21-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>8-13-07</u> . | 6) <input type="checkbox"/> Other: _____ |

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1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 12, 2007 has been entered.
2. For examination purposes, the scope of the transceiver is being treated by examiner as including, the ability to emit radio/microwave frequencies as either discrete frequencies that include the fundamental frequency and harmonics in a system that is scanned or continuously produced (see cited US 3,467,859, US 3,754,250 and Toler) or can be part of a frequency distribution produced in a pulse type of transmitter/oscillator system as in the previously applied art. Additionally from the discussion of figure 3, in the cited Lenihan (US 5,683,382) reference, it appears that an antenna matched to emit a microwave frequency (915 MHz) is capable of also emitting other harmonic and sub-harmonic frequencies. The spectrum analyzer is also being treated by examiner with a scope encompassing analyzing a set of discrete frequencies or a continuous range of frequencies. The spectrum analyzer is also being treated by examiner as having a scope of taking the spectrum and displaying it. Examiner is not requiring any type of analysis capabilities that would relate the spectrum to a property or condition of the organized chemical system.
3. Claims 4 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claims 4 and 8 "the exploring head" does not have antecedent basis.
4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
5. Claims 1-2, 4, 8, 14, 17-18 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Arjavalasingam or Robertson (Materials Research Society Symposium Proceedings 1991).

In the paper Arjavalasingam investigates anisotropic conductivity in stretch-oriented polymers with coherent microwave transient spectroscopy (COMITS). Stretch-oriented and

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doped polyacetylene and polyaniline are characterized using the coherent microwave transient spectroscopy technique. Conductivities parallel and perpendicular to the direction of elongation are determined. The measured orientation dependence of the sample transmissions is observed to follow the predictions of theory. Figure 1 shows a diagram of the device consisting of a transmitting and receiving antenna with the sample therebetween. The antenna radiate frequencies between 0 and 150 GHz (this inherently covers the MHz range of frequencies and the specifically claimed fundamental and harmonic frequencies of new claim 21) and general details of the process are found in the experimental section. The last sentence of page 6 refers one to other references for additional details of the experimental technique. Figure 2 shows several spectra in which the polymer has a given orientation between the electric field and the stretching direction.

In the paper Robertson discusses broadband microwave dielectric properties of polymers. Coherent microwave transient spectroscopy can be used to determine the complex dielectric properties of materials over a broad frequency range; the technique is based on radiation and detection of picosecond-duration electromagnetic transients by optoelectronically pulsed antennas. The technique is illustrated for a polyimide and a polyamide and doped polyacetylene. The apparatus is shown in figure 1 and is the same as in Arjavalingham. Figure 2 shows a spectrum of the received signal and its Fourier transform (inset showing frequencies in the range of 0-150 GHz). Figure 5 shows several spectra in which the polymer has a given orientation between the electric field and the stretching direction.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

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3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
7. Claims 4, 6, 8 and 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arjavalingham or Robertson as applied to claims 1-2, 4, 8, 14, 17-18 and 21 above, and further in view of Bianco, Belozeroval and Regan. Arjavalingham or Robertson cover the frequency range but do not investigate biological materials or teach continuous wave transceivers.

In the paper Bianco presents an improved system for microwave spectroscopy of small biological samples. A method is presented to measure the complex dielectric constant of biological liquids in the frequency range 100-2000 MHz. With such measurements, it is possible to obtain useful information about microscopic properties of living matter, with possible diagnostic applications.

In the paper Belozeroval discusses coherent radio frequency (RF) radiation. It is well known that the appearance of coherent RF radiation in both molecular and solid-state oscillators is due to the presence of a cavity that provides feedback between the emitted radiation and the emitting system. This pertains to both CW and pulsed operation of the oscillators.

In the paper Regan teaches a radio frequency (RF) reference generation system. This paper describes the implementation plan for the radio-frequency (rf) reference generation subsystem of the Ground Test Accelerator (GTA). The master oscillator and most of the required components of this subsystem have been acquired and tested. Hardware descriptions and test results are cited when available. Each GTA control subsystem requires a coherent, phase-stable signal from the rf reference generation subsystem to regulate the rf field in its corresponding cavity of the accelerator. The rf reference generation subsystem is configured in a star-distribution format, originating at a master oscillator that supplies three phases-coherent frequencies harmonically related to a fixed fundamental. Page 2946 teaches that the three harmonically related frequencies are 425 MHz, 850 MHz and 1700 MHz. Phase-locked loops and Wilkinson splitters distribute these signals to many different output ports. VXI monitoring modules measure the stability of the signals being distributed. Any shift in phase of the rf reference signals from the reference generation subsystem to each cavity-control subsystem will translate directly into phase errors between cavities. The allowed tolerance on the phase error for

the reference signals is ± 0.15 degrees.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to measure biological samples as taught by Bianco with pulsed or continuous wave radiation as taught by Belozerova, and Regan at the respective wavelengths taught in the Arjavalingham or Robertson devices because of the ability to measure objects with broadband radiation as taught by Arjavalingham or Robertson and the desirability of the information available relative to clinical diagnosis at the frequencies of Bianco.

8. Applicant's arguments filed October 19, 2007 and December 17, 2007 have been fully considered but they are not persuasive. Claim 19 was treated as being cancelled. Relative to the art rejections examiner notes that the apparatus claims do not specify how the spectral lines are analyzed. Furthermore claim 1 only requires the presence of the three frequencies /ranges and does not set any limits on the range of frequencies of the transceiver or the spectrum analyzer. Claims 1, 6 and 14 do not require the transceiver to be emitting the frequencies as a continuous wave. The use of "continuum" in claim 6 requires a continuous range of frequencies, not that the frequencies are emitted as a continuous wave. Thus the claims are anticipated by a reference having a transceiver coupled to a spectrum analyzer regardless of the frequency range as long as the frequency range includes the required a fundamental frequency and harmonic frequencies. Since the Arjavalingham and Robertson references cover the specifically disclosed frequency range they inherently have a fundamental frequency and at least one harmonic and are anticipatory of the claimed apparatus. The preamble is not being given any weight because: first there appears to be nothing in the disclosure that would prevent one from using the instantly described device on objects other than animal tissues or living bodies and second, polymers constitute an organized chemical system. Thus the preamble is not of patentable moment.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited art relates to various instruments for emitting and testing materials including tissues.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arlen Soderquist whose telephone number is (571) 272-1265. The examiner can normally be reached on Monday-Thursday and Alternate Fridays.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Arlen Soderquist/
Primary Examiner, Art Unit 1797